

# IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant:	§ Group Art Unit: 1763
NGUYEN ET AL.	§
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Serial No.: N/A	§
	§ Examiner: Erin Fieler
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Filed:	§
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	§
For: Multi-thermal zone shielding	§ Attorney Docket No. SIM012C
Apparatus	§

## PRELIMINARY AMENDMENT

COMMISSIONER OF PATENTS  
AND TRADEMARKS  
Washington, D.C. 20231

Dear Sir:

Before computing fees, please amend the application as follows:

### In the Claims:

Please cancel claims 1-20.

Please add the following claims:

21. A multi-thermal zone shielding apparatus for shielding a portion of a hot workpiece in a high temperature processing system, the apparatus keeping the workpiece temperature hot at the shielded area and maintaining the rest of the shield cooler, the apparatus comprising:
  - a) a heater to heat the workpiece within the system, the heater being positioned underneath the workpiece;
  - b) a multi-thermal zone shield positioned above the workpiece, the shield covering an engaged portion of the workpiece and shielding the engaged portion of the workpiece during processing thereof to prevent processing on the engaged portion of the workpiece, the multi-thermal zone shield comprising:

- a low thermal transmittivity section in the portion of the shield to be engaged to shield the workpiece, the low transmittivity section proximately positioned near the workpiece for preventing heat lost through the shielded portion of the hot workpiece; and
- a high thermal transmittivity section coupled to the low thermal transmittivity section and extending away from the workpiece, the high thermal transmittivity section allowing thermal energy from the heater and from the heated workpiece to transmit through the shield without heating the shield.

(New) 22. An apparatus as in claim 21 in which the shield is made of transparent material, and the low thermal transmittivity section of the shield is processed to achieve an opaque property.

(New) 23. An apparatus as in claim 21 in which the low thermal transmittivity section of the shield is made of opaque material and the high thermal transmittivity section of the shield is made of transparent material.

(New) 24. An apparatus as in claim 21 in which the shield is made of quartz or glass material.

(New) 25. An apparatus as in claim 24, wherein the low thermal transmittivity section of the shield is processed to become opaque and the high thermal transmittivity section of the shield is processed to become transparent.

(New) 26. An apparatus as in claim 21 further comprising a shield support to support the shield so that the shield and the workpiece are spaced apart when the workpiece is disengaged from the shield.

(New) 27. An apparatus as in claim 26 further comprising a shield aligner connected to the shield and the shield support for aligning the shield with

the shield support.

(New) 28. An apparatus as in claim 21, further comprising a movable shaft connected to a workpiece support.

(New) 29. An apparatus as in claim 21 in which the heater further comprises a heated workpiece support having a heated top surface for supporting and heating the workpiece.

(New) 30. An apparatus as in claim 21 in which the heater comprises a lamp heater for heating the workpiece and the apparatus further comprises a non-heated workpiece support for supporting the workpiece.

(New) 31. An apparatus as in claim 30 in which the heated workpiece support comprises a taper outer edge and the shield comprises a taper inner edge of similar angle, whereby the shield maybe moved into alignment with the workpiece support in the engaged position.

(New) 32. A multi-thermal zone shielding apparatus for shielding a portion of a hot workpiece in a high temperature processing system, the apparatus keeping the workpiece temperature hot at the shielded area and maintaining the rest of the shield cooler, the apparatus comprising:

- a) a heated workpiece support adapted to support the workpiece in the system;
- b) a multi-thermal zone shield for engaging a portion of the workpiece and shielding the engaged portion of the workpiece during processing thereof to prevent processing on the engaged portion of the workpiece, the multi-thermal zone shield comprising
  - a low thermal transmittivity section in the portion of the shield to be engaged and shielding the workpiece;
  - a high thermal transmittivity section in the rest of shield, the portion of the shield not engaged with the workpiece having high thermal transmittivity to allow more thermal energy from the heated workpiece transmitting through the shield without heating the

shield, thus maintaining a cooler temperature at the portion of the shield not engaged with the workpiece;

- c) an actuator to move and engage the shield with the portion of the workpiece; and
- d) a cavity defined by the heated workpiece support, the workpiece, and the shield, the cavity adapted to retain a non-reactive gas in the vicinity of the shielded portion of the workpiece.

(New) 33. An apparatus as in claim 32, wherein the shield is made of transparent material, and the low thermal transmittivity section of the shield is opaque.

(New) 34. An apparatus as in claim 32 in which the low thermal transmittivity section of the shield is made of opaque material and the high thermal transmittivity section of the shield is made of transparent material.

(New) 35. An apparatus as in claim 32 in which the shield is made of quartz or glass material, and the low thermal transmittivity section of the shield is opaque and the high thermal transmittivity section of the shield is transparent.

(New) 36. An apparatus as in claim 32 in which the shield stays close to the workpiece support so that the cavity retaining the non-reactive gas has no large leak when the moving means engages the workpiece with the shield.

(New) 37. An apparatus as in claim 32 in which the workpiece is a semiconductor wafer, and the cavity retains the non-reactive gas in the vicinity of the circumferential edge of the semiconductor wafer.

(New) 38. An apparatus as in claim 32 further comprising a shield support, wherein the shield and the workpiece are spaced apart when the actuator disengages the workpiece from the shield.

(New) 39. An apparatus as in claim 32 in which the actuator comprises a movable shaft connected to the workpiece support.

(New) 40. An apparatus as in claim 32 further comprising shield alignment device, connected to the shield and the shield support.

(New) 41. A replaceable multi-thermal zone workpiece shielding plate apparatus for engaging a portion of the workpiece and shielding the engaged portion of the workpiece during processing to prevent processing on the engaged portion of the workpiece in a high temperature processing system, the apparatus comprising:

- a) a replaceable shield of comparable weight as the workpiece for allowing replacement of the shield in the same way as the replacement of the workpiece;
- b) a low thermal transmittivity section in the portion of the shield to be engaged and shielding the workpiece; and
- c) a high thermal transmittivity section in the rest of shield.

(New) 42. The apparatus of claim 41, further comprising an actuator for engaging the shield with the portion of the workpiece.

(New) 43. The apparatus of claim 41, further comprising a susceptor lift coupled to the workpiece.

(New) 44. The apparatus of claim 41, further comprising:

- a susceptor adapted to receive the workpiece; and
- a shaft coupled to the susceptor to engage the shield with the portion of the workpiece.

(New) 45. The apparatus of claim 41, further comprising a heater positioned underneath the workpiece to heat the workpiece within the system.

(New) 46. An apparatus as in claim 45 in which the heater further comprises a heated workpiece support having a heated top surface for supporting and

heating the workpiece.

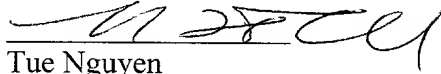
(New) 47. An apparatus as in claim 45 in which the heater comprises a lamp heater for heating the workpiece and the apparatus further comprises a non-heated workpiece support for supporting the workpiece.

47. An apparatus as in claim 45 in which the heater comprises a lamp heater for heating the workpiece and the apparatus further comprises a non-heated workpiece support for supporting the workpiece.

### REMARKS

Applicant respectfully submits that no new matter has been added by the foregoing amendments. Moreover, Applicant submits all claims of the present application are patentable over the prior art. Allowance of all claims is respectfully requested.

Respectfully submitted,

  
Tue Nguyen

Date 1/19/2001